Drinking Water Surveillance Program

AJAX WATER SUPPLY PLANT

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AJAX
WATER SUPPLY PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1988

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

AJAX WATER SUPPLY PLANT 1988 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored.

The Ajax Water Supply Plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, sedimentation, filtration, disinfection and fluoridation. This plant has a design capacity of 55 x 1000 m^3/day. Approximately 78,380 people are supplied water from this plant and through a system interconnection from the Oshawa/Whitby Supply system when required.

Samples from the raw and treated water at the plant were taken on a monthly basis beginning in May, sampling in the distribution system began in December. Samples were analyzed for approximately 160 parameters during 1988. Parameters were divided into the following groups Bacteriological, Inorganic and Physical(Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticide and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Specific Pesticides and Chlorophenols were analysed in June and November only.

A summary of results is shown in Table 1.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below any applicable health related ODWOs.

Of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

During 1988 the DWSP sampling results indicated that the Ajax Water Supply Plant produced good quality water at the plant and this quality was maintained in the distribution system.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE BY SCAN

SCAN	RAW TESTS	RAW POSITIVE	RAW %POSITIVE	TREATED TESTS	TREATED POSITIVE	TREATED %POSITIVE	SITE 1 TESTS	SITE 1 POSITIVE	SITE 1 %POSITIVE
BACTERIOLOGICAL	28	27	96	28	7	25	3	0	0
CHEMISTRY (FLD)	24	24	100	48	48	100	12	12	100
CHEMISTRY (LAB)	166	140	84	166	121	72	37	30	81
METALS	192	98	51	192	88	45	47	27	57
CHLOROAROMATICS	112	0	0	112	0	0	14	0	0
CHLOROPHENOLS	12	0	0	6	0	0	.	.	.
PAH	150	0	0	153	0	0	.	.	.
PESTICIDES & PCB	268	0	0	268	0	0	34	0	0
PHENOLICS	8	1	12	8	0	0	.	.	.
SPECIFIC PESTICIDES	56	0	0	38	0	0	0	0	0
VOLATILES	229	0	0	229	32	13	29	4	13
TOTAL	1245	290		1248	296		176	73	

NO HEALTH RELATED GUIDELINES WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

AJAX WATER SUPPLY PLANT
1988 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 52 plants are being monitored. Appendix A contains a detailed description of the DWSP.

The DWSP program was initiated at the Ajax Water Supply Plant in May 1988.

This report contains information and results for 1988.

PLANT DESCRIPTION

The Ajax Water Supply Plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, sedimentation, filtration, disinfection and fluoridation. This plant has a design capacity of 55 x 1000 m^3/day and flows for day of sampling ranging from 9.1 x 1000 m^3/day to 37.8 x 1000 m^3/day. Approximately 78,380 people are supplied

water from this plant and through a system interconnection from the Oshawa/Whitby Supply system when required.

The plant location is shown in Figure 1. Plant Process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

METHODS

Water samples were obtained from three DWSP approved locations;

i) Plant Raw - The water originated from the wet well prior to addition of chemicals and was sampled through a stainless steel pump and stainless steel line. The sample tap is located at the wet well.

ii) Plant Treated - The water originated from the highlift discharge after addition of all treatment chemicals and was sampled through a stainless steel line. The sample tap is located at the highlift.

iii) Distribution System - Site 1 - The distance of this house from the plant is 2.0 kilometers. Water was sampled through copper plumbing from the basement laundry tap.

Sample lines in the plant were flushed prior to sampling to ensure

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM

SITE LOCATION MAP

AJAX WATER TREATMENT PLANT

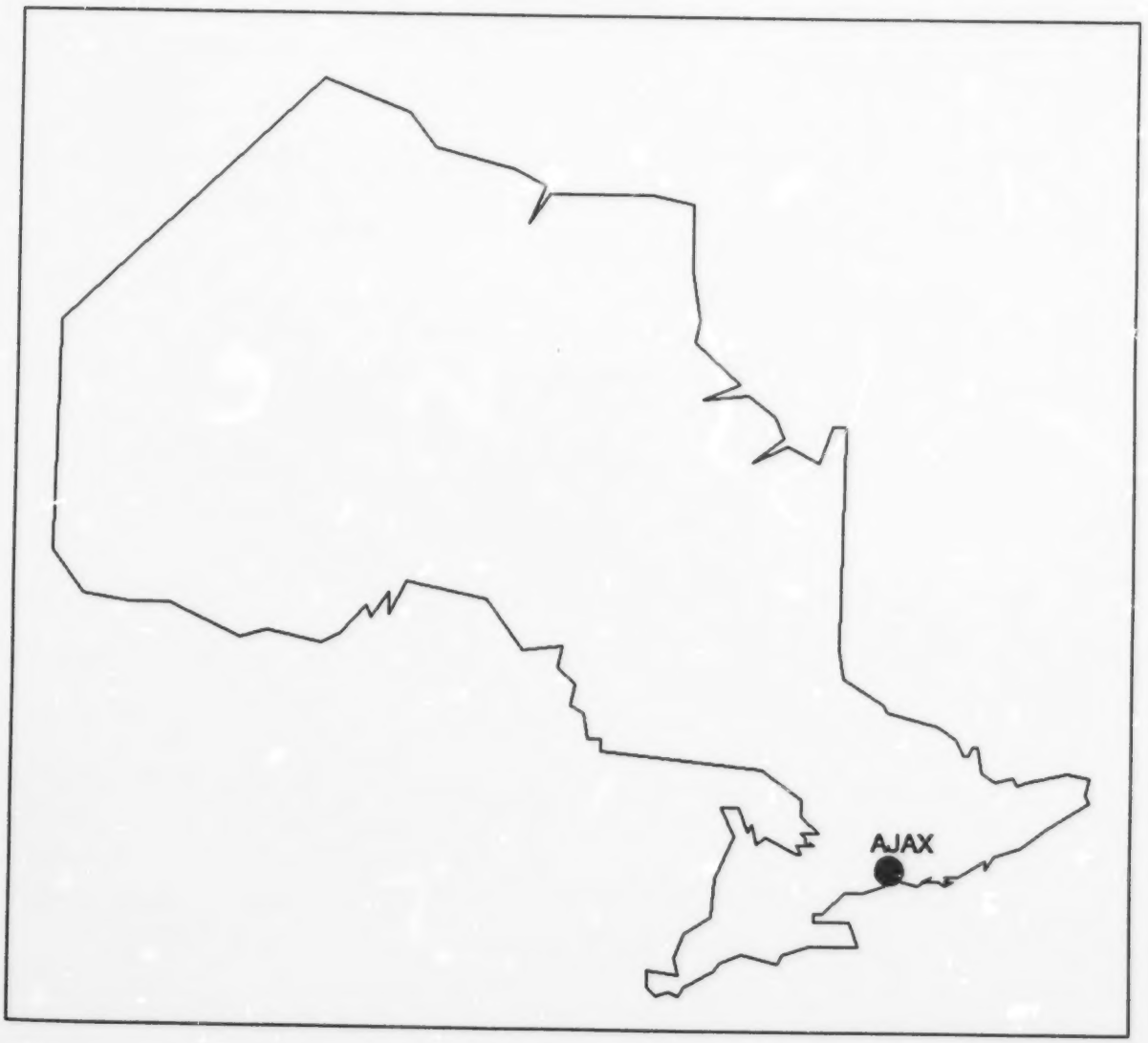

Figure 2

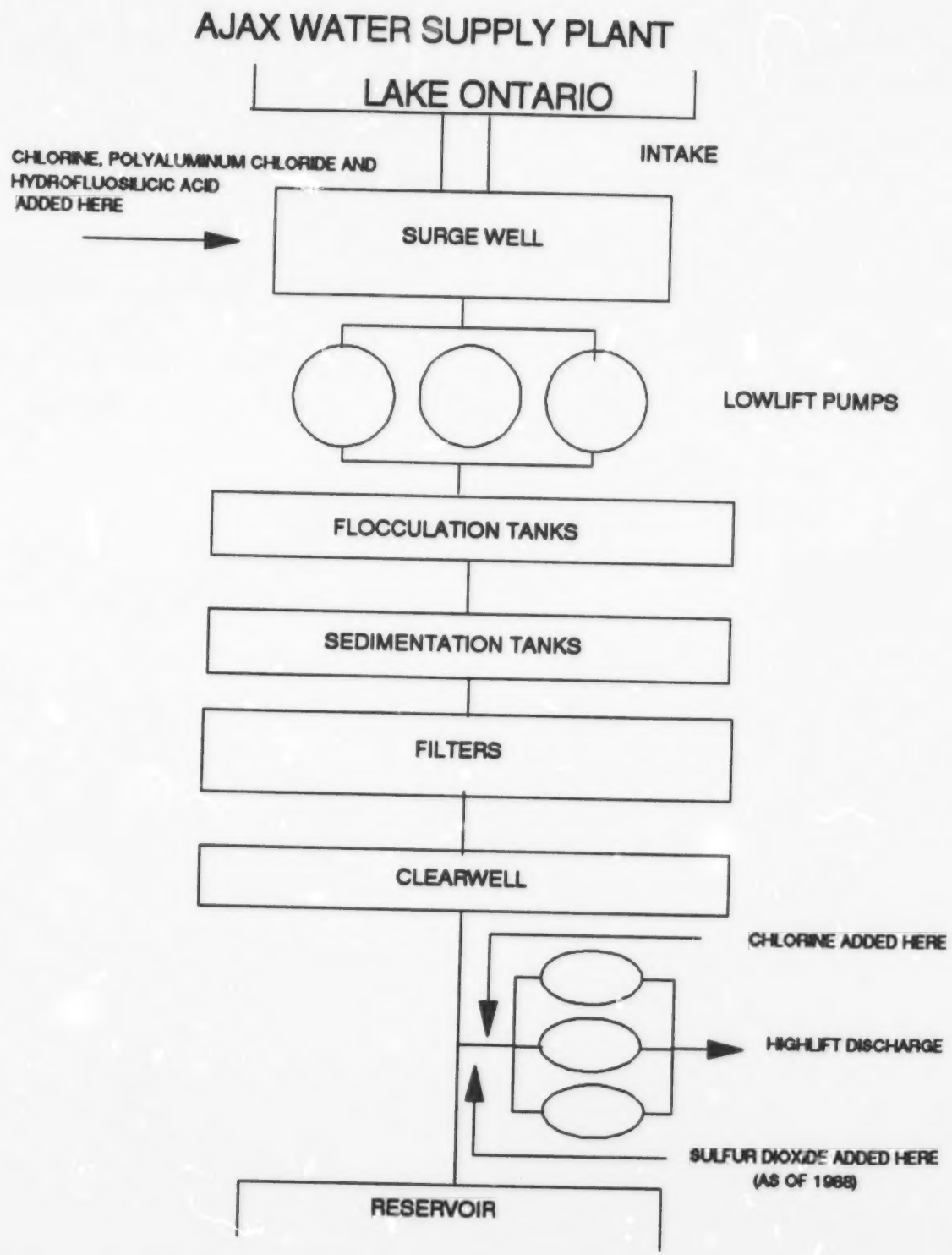
AJAX WATER SUPPLY PLANT
LAKE ONTARIO
INTAKE
CHLORINE, POLYALUMINUM CHLORIDE AND HYDROFLUOSILICIC ACID ADDED HERE
SURGE WELL
LOWLIFT PUMPS
FLOCCULATION TANKS
SEDIMENTATION TANKS
FILTERS
CLEARWELL
CHLORINE ADDED HERE
HIGHLIFT DISCHARGE
SULFUR DIOXIDE ADDED HERE (AS OF 1988)
RESERVOIR

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

AJAX WATER SUPPLY PLANT

LOCATION:	LAKE DRIVEWAY AJAX, ONTARIO (416-668-2800)
SOURCE:	RAW WATER SOURCE - LAKE ONTARIO
DESIGN CAPACITY:	55 (1000 M^3/DAY)
OPERATION:	REGIONAL MUNICIPALITY OF DURHAM
PLANT SUPERINTENDENT:	L. MURRAY
MINISTRY REGION:	CENTRAL
DISTRICT OFFICER:	R. BOYD

MUNICIPALITY SERVED	POPULATION
AJAX	34,900
PICKERING	43,480

that the water obtained was indicative of its origin and not residual water standing in the sample line.

At both distribution system locations two types of samples were obtained: a standing and a free flow. The standing sample consisted of water that had been in the household plumbing andservice connection for a minimum of six hours. These samples are used to make an assessment of the amount by which the levels inorganic compounds and metals may be changed on standing due to leaching from (or deposition on) the plumbing system. The only analyses carried on the standing samples therefore, are General Chemistry and Metals. The free flow sample represented fresh water from the distribution main that had been flowing at the sample tap for five minutes before being sampled.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between the two sampling points by the sample day flow. For example, if it was determined that the retention time within the plant was five hours then there would be a five hour interval between the raw and treated sampling. Similarly if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner (Appendix B).

Sample day flow, treatment chemical dosages and Field Chemistry measurements were recorded on the day of sampling and were entered on the DWSP database as submitted.

RESULTS

Water at the Ajax Water Treatment Plant was sampled eight times and the distribution system once in 1988, each sample was analysed for approximately 160 parameters. The Specific Pesticides and Chlorophenols scans were sampled for in June and November only. Polynuclear Aromatic Hydrocarbons and Phenolics were only analysed for in the raw and treated water at the plant.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times that a positive or trace result was detected is also reported. Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it

cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analysed in DWSP.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently published (ISBN 0-7729-4461-X) by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

Although some of the parameters measured on DWSP may be present as a result of pollution, many of the compounds detected are naturally

occurring or are treatment by-products.

Plant operational personnel address occurrences of taste and odour or biological water quality parameters. The DWSP does not assess these aspects of the water supply.

As stated under Results, traces do not indicate quantifiable values, as defined by established MOE Laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. **DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.**

Bacteriology

Positive results for the Bacteriology scan were present seven times in the treated water. The positive parameters were Standard Plate Count and Total Coliform Background.

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality; the routine monitoring program usually requires the taking of multiple samples in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Further, bacteriological limits were

developed in acknowledgement that the presence of coliforms may be detected due to their non-uniform distribution throughout the distribution system and the fact that their enumeration is subject to considerable variation. Routine bacteriological monitoring, as outlined in the ODWOs is carried out by the operating authority.

Inorganic and Physical Parameters

Laboratory and Field Chemistry

The results for Laboratory and Field Chemistry scans were below any applicable health related ODWOs.

The Langelier Index is used extensively in estimating the corrosion potential of water. An increasingly negative index indicates the increasing possibility of corrosion. It is considered sound engineering practice to maintain a slightly positive Langelier Index. The Langelier Index for Ajax is consistently positive.

As part of the treatment process hydrofluosilicic acid is added to the treated water (Table 3). Where fluoridation is practiced, the fluoride concentration recommended in the ODWO is 1.2 mg/L, plus or minus 0.2 mg/L. This level was not maintained as indicated by the Fluoride levels which were below 1.0 mg/L on three occasions and above 1.4 mg/L once in the treated water.

Metals

The results reported for the Metal scan were below any applicable health related ODWOs.

Elevated levels of Copper, Lead and Zinc were detected in the standing samples from the distribution system site as compared to the free flow samples thus, indicating that these metals were leached from the household plumbing as the water stood overnight. Although the Langelier Index indicates minimal potential for corrosion some metals will be leached in standing samples in most supplies.

At present, there is no evidence that Aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of residual Aluminum in the treated water is important to indicate the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as Al in the water leaving the plant to avoid problems in the distribution system. Aluminum values exceeded the ODWO operational guideline three times in the treated water and distributed water.

<u>Organic Parameters</u>

Chloroaromatics

Results of the Chloroaromatics scan showed that none were detected.

Chlorophenols

Results of the Chlorophenol scan showed that no Chlorophenols were detected.

Pesticides and PCB (Polychlorinated Biphenyl)

Results of the Pesticides and PCB scan showed that no PCBs were detected and that two pesticides were detected:

Alpha BHC

Lindane

There are several isomers of BHC (Benzene Hexachloride); gamma Lindane is the active ingredient in the pesticide Lindane, while alpha BHC is the isomer predominantly found in surface waters in the Great Lakes basin.

Alpha BHC was detected at trace levels, five times in the raw water, four times in the treated water and once in the distribution system Site 1 water.

Lindane was detected at trace levels, once in the treated water and in the single sample from the distribution system.

Specific Pesticides

Results of the Specific Pesticides scan showed that none were detected.

Phenolics

The maximum desirable concentration of phenolic substances in drinking water is 2.0 ug/L. This limit has been set primarily to prevent the occurrence of undesirable tastes and odours, particularly in chlorinated water. Phenolics were detected at 1.0 ug/L in the December raw water sample. Phenolics were detected at trace levels, five times in the raw water and six times in the treated water. Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes.

Polynuclear Aromatic Hydrocarbons (PAH)

Results of the PAH scan showed that five PAHs were detected:

- Anthracene
- Fluoranthene
- Pyrene
- Benzo(K)Fluoranthene
- Benzo(A)Pyrene

Anthracene, Fluoranthene, Pyrene and Benzo(A)Pyrene were all found at trace levels, once in the July raw water sample.

Benzo(K)Fluoranthene was detected at a trace level, in the raw water sample in December.

Volatiles

Results of the Volatile scan showed that five parameters, other than Trihalomethanes(THMs), were detected:

Toluene

Ethylbenzene

Ortho-Xylene

Styrene

Tetrachloroethylene

Toluene was detected at a trace level, once in a raw water sample. The detection of toluene at low, trace levels is a laboratory artifact derived from the analytical methodology. The purge-and-trap analytical technique depends on the purging of the volatile organics in the water sample with helium gas onto a Tenax trapping column. The volatile materials are subsequently thermally desorbed, separated and quantified. Tenax, a toluene-like polymeric material, tends to decompose sporadically upon heating into toluene and other aromatic componenets (ethylbenzene and xylene) giving instrument blanks in the order of 0.05 ug/L.

The detected trace levels of Styrene are also considered to be laboratory artifacts due to the outgassing of monomeric styrene from the polystyrene shipping containers. The sporadic background levels from this source are in the order of 0.05 ug/L.

Ethylbenzene was detected at trace levels, four times in the

treated water and in the single sample from the distribution system.

Ortho-Xylene (O-Xylene) was detected at a trace level, once in the treated water.

The volatiles listed above are typically found on an occasional basis at other water supplies included on the DWSP usually at trace levels.

Tetrachloroethylene was detected at trace levels, twice in the treated water.

THMs are known to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane, Dichlorobromomethane and Total THMs were detected in all treated waters. Chloroform was detected once at a trace level in the raw water. Dichlorobromomethane and Chlorodibromomethane were detected at trace levels, twice in the raw water. Bromoform was detected at trace levels in all of the treated waters. All Total THM occurences, ranging from 36.6 ug/L - 54.15 ug/L were well below the ODWO of 350 ug/L.

CONCLUSIONS

The Ajax Water Supply Plant for the sample year of 1988 produced good quality water at the plant.

No health related guidelines, for organic or inorganic parameters, were exceeded during 1988.

RECOMMENDATIONS

Four recommendations can be made:

1) The data base should be reviewed in consultation with Regional, Plant and DWSP personnel to determine if sampling location, sampling frequency and the number of parameters analysed should be reduced.

2) The reason for elevated Aluminum levels in treated water samples should be investigated.

3) Fluoridation practises should be adjusted to maintain the recommended level of fluoride in distributed water.

4) The raw water sample location should be reassessed to ensure that it meets the DWSP sampling protocol.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP SAMPLE DAY CONDITIONS FOR 1988

	SAMPLE DAY CONDITIONS		TREATMENT CHEMICAL DOSAGES (MG/L)			
DATE	RETENTION TIME(HRS)	FLOW (1000 M3)	PRE-CHLORINATION CHLORINE	COAGULATION POLY ALUMINUM CHLORIDE	FLUORIDATION HYDROFLUOSILICIC ACID	POST-CHLORINATION CHLORINE
MAY 10	2.0	22.3	1.30	7.32	1.09	.12
JUN 07	2.5	25.4	1.26	8.61	1.00	.14
JUL 12	2.0	28.5	1.10	6.00	.	.12
AUG 09	2.0	37.8	1.58	7.20	1.19	.29
SEP 13	2.0	26.6	1.42	1.40	1.14	.16
OCT 11	2.0	9.1	1.44	3.40	1.05	.22
NOV 15	2.0	17.9	1.73	1.70	1.04	.20
DEC 07	2.0	15.8	.	4.50	1.06	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	8	7	0	.	.	.	.	.	.
	STANDRD PLATE CNT MF	4	4	0	8	4	0	1	0	0
	P/A BOTTLE	.	.	.	4	0	0	.	.	.
	TOTAL COLIFORM MF	8	8	0	8	0	0	1	0	0
	T COLIFORM BCKGRD MF	8	8	0	8	3	0	1	0	0
*TOTAL SCAN BACTERIOLOGICAL		28	27	0	28	7	0	3	0	0
*TOTAL GROUP BACTERIOLOGICAL		28	27	0	28	7	0	3	0	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	8	8	0	2	2	0
	FLD CHLORINE FREE	.	.	.	8	8	0	2	2	0
	FLD CHLORINE (TOTAL)	.	.	.	8	8	0	2	2	0
	FLD PH	8	8	0	8	8	0	2	2	0
	FLD TEMPERATURE	8	8	0	8	8	0	2	2	0
	FLD TURBIDITY	8	8	0	8	8	0	2	2	0
*TOTAL SCAN CHEMISTRY (FLD)		24	24	0	48	48	0	12	12	0
CHEMISTRY (LAB)	ALKALINITY	8	8	0	8	8	0	2	2	0
	CALCIUM	8	8	0	8	8	0	2	2	0
	CYANIDE	8	0	1	8	0	0	1	0	0
	CHLORIDE	8	8	0	8	8	0	2	2	0
	COLOUR	8	2	6	8	1	6	2	0	2

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SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHEMISTRY (LAB)	CONDUCTIVITY	8	8	0	8	8	0	2	2	0
	FLUORIDE	8	8	0	8	8	0	2	2	0
	HARDNESS	8	8	0	8	8	0	2	2	0
	IONCAL	8	6	0	8	6	0	2	2	0
	LANGELIER'S INDEX	8	8	0	8	8	0	2	2	0
	MAGNESIUM	8	8	0	8	8	0	2	2	0
	SODIUM	8	8	0	8	8	0	2	2	0
	AMMONIUM TOTAL	8	8	0	8	4	3	2	2	0
	NITRITE	8	6	2	8	1	5	2	0	2
	TOTAL NITRATES	8	8	0	8	8	0	2	2	0
	NITROGEN TOT KJELD	8	8	0	8	7	1	2	2	0
	PH	8	8	0	8	8	0	2	2	0
	PHOSPHORUS FIL REACT	8	2	5	8	2	4	.	.	.
	PHOSPHORUS TOTAL	8	6	2	8	1	4	.	.	.
	SULPHATE	6	6	0	6	6	0	2	2	0
	TURBIDITY	8	8	0	8	5	3	2	0	2
*TOTAL SCAN CHEMISTRY (LAB)		166	140	16	166	121	26	37	30	6
METALS	SILVER	8	0	0	8	0	2	2	0	0
	ALUMINUM	8	8	0	8	8	0	2	2	0
	ARSENIC	8	3	5	8	1	7	2	0	2
	BARIUM	8	8	0	8	8	0	2	2	0
	BORON	8	8	0	8	8	0	2	2	0

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DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BERYLLIUM	8	0	5	8	0	7	2	0	2
	CADMIUM	8	0	3	8	0	2	2	0	1
	COBALT	8	0	8	8	0	8	2	0	2
	CHROMIUM	8	5	3	8	5	3	2	2	0
	COPPER	8	7	1	8	8	0	2	2	0
	IRON	8	1	7	8	0	2	2	0	0
	MERCURY	8	0	3	8	0	4	1	0	1
	MANGANESE	8	8	0	8	3	5	2	2	0
	MOLYBDENUM	8	8	0	8	8	0	2	2	0
	NICKEL	8	1	6	8	1	5	2	2	0
	LEAD	8	2	6	8	3	4	2	1	1
	ANTIMONY	8	8	0	8	8	0	2	2	0
	SELENIUM	8	0	6	8	0	8	2	0	2
	STRONTIUM	8	8	0	8	8	0	2	2	0
	TITANIUM	8	7	1	8	6	2	2	2	0
	THALLIUM	8	0	3	8	0	2	2	0	0
	URANIUM	8	8	0	8	5	3	2	2	0
	VANADIUM	8	0	8	8	0	8	2	0	2
	ZINC	8	8	0	8	8	0	2	2	0
*TOTAL SCAN METALS		192	98	65	192	88	72	47	27	13
*TOTAL GROUP INORGANIC & PHYSICAL		382	262	81	406	257	98	96	69	19
CHLOROAROMATICS	HEXACHLOROBUTADIENE	8	0	0	8	0	0	1	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	123 TRICHLOROBENZENE	8	0	0	8	0	0	1	0	0
	1234 T-CHLOROBENZENE	8	0	0	8	0	0	1	0	0
	1235 T-CHLOROBENZENE	8	0	0	8	0	0	1	0	0
	124 TRICHLOROBENZENE	8	0	0	8	0	0	1	0	0
	1245 T-CHLOROBENZENE	8	0	0	8	0	0	1	0	0
	135 TRICHLOROBENZENE	8	0	0	8	0	0	1	0	0
	HCB	8	0	0	8	0	0	1	0	0
	HEXACHLOROETHANE	8	0	0	8	0	0	1	0	0
	OCTACHLOROSTYRENE	8	0	0	8	0	0	1	0	0
	PENTACHLOROBENZENE	8	0	0	8	0	0	1	0	0
	236 TRICHLOROTOLUENE	8	0	0	8	0	0	1	0	0
	245 TRICHLOROTOLUENE	8	0	0	8	0	0	1	0	0
	26A TRICHLOROTOLUENE	8	0	0	8	0	0	1	0	0
*TOTAL SCAN CHLOROAROMATICS		112	0	0	112	0	0	14	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	0	0	1	0	0	.	.	.
	2345 T-CHLOROPHENOL	2	0	0	1	0	0	.	.	.
	2356 T-CHLOROPHENOL	2	0	0	1	0	0	.	.	.
	245-TRICHLOROPHENOL	2	0	0	1	0	0	.	.	.
	246-TRICHLOROPHENOL	2	0	0	1	0	0	.	.	.
	PENTACHLOROPHENOL	2	0	0	1	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS		12	0	0	6	0	0	0	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PAH	PHENANTHRENE	8	0	0	9	0	0	.	.	.
	ANTHRACENE	9	0	1	9	0	0	.	.	.
	FLUORANTHENE	9	0	1	9	0	0	.	.	.
	PYRENE	9	0	1	9	0	0	.	.	.
	BENZO(A)ANTHRACENE	9	0	0	9	0	0	.	.	.
	CHRYSENE	9	0	0	9	0	0	.	.	.
	DIMETH. BENZ(A)ANTHR	9	0	0	9	0	0	.	.	.
	BENZO(E) PYRENE	9	0	0	9	0	0	.	.	.
	BENZO(J) FLUORANTHEN	0	0	0	0	0	0	.	.	.
	BENZO(B) FLUORANTHEN	9	0	0	9	0	0	.	.	.
	PERYLENE	9	0	0	9	0	0	.	.	.
	BENZO(K) FLUORANTHEN	8	0	1	9	0	0	.	.	.
	BENZO(A) PYRENE	9	0	1	9	0	0	.	.	.
	BENZO(G,H,I) PERYLEN	9	0	0	9	0	0	.	.	.
	DIBENZO(A,H) ANTHRAC	9	0	0	9	0	0	.	.	.
	INDENO(1,2,3-C,D) PY	9	0	0	9	0	0	.	.	.
	BENZO(A) CHRYSENE	9	0	0	9	0	0	.	.	.
	ANTHANTHRENE	0	0	0	0	0	0	.	.	.
	CORONENE	8	0	0	9	0	0	.	.	.
*TOTAL SCAN PAH		150	0	5	153	0	0	0	0	0
PESTICIDES & PCB	ALDRIN	8	0	0	8	0	0	1	0	0
	ALPHA BHC	8	0	5	8	0	4	1	0	1

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	BETA BHC	8	0	0	8	0	0	1	0	0
	LINDANE	8	0	0	8	0	1	1	0	1
	ALPHA CHLORDANE	8	0	0	8	0	0	1	0	0
	GAMMA CHLORDANE	8	0	0	8	0	0	1	0	0
	DIELDRIN	8	0	0	8	0	0	1	0	0
	METHOXYCHLOR	8	0	0	8	0	0	1	0	0
	ENDOSULFAN I	8	0	0	8	0	0	1	0	0
	ENDOSULFAN II	8	0	0	8	0	0	1	0	0
	ENDRIN	8	0	0	8	0	0	1	0	0
	ENDOSULFAN SULPHATE	8	0	0	8	0	0	1	0	0
	HEPTACHLOR EPOXIDE	8	0	0	8	0	0	1	0	0
	HEPTACHLOR	8	0	0	8	0	0	1	0	0
	MIREX	8	0	0	8	0	0	1	0	0
	OXYCHLORDANE	8	0	0	8	0	0	1	0	0
	OPDDT	8	0	0	8	0	0	1	0	0
	PCB	8	0	0	8	0	0	1	0	0
	DDD	8	0	0	8	0	0	1	0	0
	PPDDE	8	0	0	8	0	0	1	0	0
	PPDDT	8	0	0	8	0	0	1	0	0
	AMETRINE	8	0	0	8	0	0	1	0	0
	ATRAZINE	8	0	0	8	0	0	1	0	0
	ATRATONE	8	0	0	8	0	0	1	0	0
	CYANAZINE	8	0	0	8	0	0	1	0	0
	DES ETHYL ATRAZINE	6	0	0	6	0	0	1	0	0
	DES ETHYL SIMAZINE	6	0	0	6	0	0	1	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	PROMETONE	8	0	0	8	0	0	1	0	0
	PROPAZINE	8	0	0	8	0	0	1	0	0
	PROMETRYNE	8	0	0	8	0	0	1	0	0
	METRIBUZIN	8	0	0	8	0	0	1	0	0
	SIMAZINE	8	0	0	8	0	0	1	0	0
	ALACHLOR	8	0	0	8	0	0	1	0	0
	METOLACHLOR	8	0	0	8	0	0	1	0	0
*TOTAL SCAN PESTICIDES & PCB		268	0	5	268	0	5	34	0	2
PHENOLICS	PHENOLICS	8	1	5	8	0	6	.	.	.
*TOTAL SCAN PHENOLICS		8	1	5	8	0	6	0	0	0
SPECIFIC PESTICIDES	TOXAPHENE	0	0	0	0	0	0	0	0	0
	2,4,5-T	2	0	0	1	0	0	.	.	.
	2,4-D	2	0	0	1	0	0	.	.	.
	24DCHLRPHENOXYBUTYRC	2	0	0	1	0	0	.	.	.
	2,4 D PROPIONIC ACID	2	0	0	1	0	0	.	.	.
	DICAMBA	2	0	0	1	0	0	.	.	.
	PICHLORAM	0	0	0	0	0	0	.	.	.
	SILVEX	2	0	0	1	0	0	.	.	.
	DIAZINON	2	0	0	1	0	0	.	.	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	DICHLOROVOS	2	0	0	1	0	0	.	.	.
	CHLORPYRIFOS	2	0	0	1	0	0	.	.	.
	ETHION	2	0	0	1	0	0	.	.	.
	AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.
	MALATHION	2	0	0	1	0	0	.	.	.
	MEVINPHOS	2	0	0	1	0	0	.	.	.
	METHYL PARATHION	2	0	0	1	0	0	.	.	.
	METHYLTRITHION	2	0	0	1	0	0	.	.	.
	PARATHION	2	0	0	1	0	0	.	.	.
	PHORATE	2	0	0	1	0	0	.	.	.
	RELDAN	2	0	0	1	0	0	.	.	.
	RONNEL	2	0	0	1	0	0	.	.	.
	AMINOCARB	0	0	0	0	0	0	.	.	.
	BENOMYL	2	0	0	2	0	0	.	.	.
	BUX	2	0	0	2	0	0	.	.	.
	CARBOFURAN	2	0	0	2	0	0	.	.	.
	CICP	2	0	0	2	0	0	.	.	.
	DIALLATE	2	0	0	2	0	0	.	.	.
	EPTAM	2	0	0	2	0	0	.	.	.
	IPC	2	0	0	2	0	0	.	.	.
	PROPOXUR	2	0	0	2	0	0	.	.	.
	CARBARYL	2	0	0	2	0	0	.	.	.
	BUTYLATE	2	0	0	2	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES		56	0	0	38	0	0	0	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	BENZENE	8	0	0	8	0	0	1	0	0
	TOLUENE	8	0	0	8	0	1	1	0	0
	ETHYLBENZENE	8	0	0	8	0	4	1	0	1
	P-XYLENE	8	0	0	8	0	0	1	0	0
	M-XYLENE	8	0	0	8	0	0	1	0	0
	O-XYLENE	8	0	0	8	0	1	1	0	0
	STYRENE	3	0	1	3	0	0	1	0	0
	1,1 DICHLOROETHYLENE	8	0	0	8	0	0	1	0	0
	METHYLENE CHLORIDE	8	0	0	8	0	0	1	0	0
	T1,2DICHLOROETHYLENE	8	0	0	8	0	0	1	0	0
	1,1 DICHLOROETHANE	8	0	0	8	0	0	1	0	0
	CHLOROFORM	8	0	3	8	8	0	1	1	0
	111, TRICHLOROETHANE	8	0	0	8	0	0	1	0	0
	1,2 DICHLOROETHANE	8	0	0	8	0	0	1	0	0
	CARBON TETRACHLORIDE	8	0	0	8	0	0	1	0	0
	1,2 DICHLOROPROPANE	8	0	0	8	0	0	1	0	0
	TRICHLOROETHYLENE	8	0	0	8	0	0	1	0	0
	DICHLOROBROMOMETHANE	8	0	2	8	8	0	1	1	0
	112 TRICHLOROETHANE	8	0	0	8	0	0	1	0	0
	CHLORODIBROMOMETHANE	8	0	2	8	8	0	1	1	0
	T-CHLOROETHYLENE	8	0	0	8	0	2	1	0	0
	BROMOFORM	8	0	0	8	0	8	1	0	1
	1122 T-CHLOROETHANE	8	0	0	8	0	0	1	0	0
	CHLOROBENZENE	8	0	0	8	0	0	1	0	0
	1,4 DICHLOROBENZENE	8	0	0	8	0	0	1	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP

SUMMARY TABLE OF RESULTS (1988)

SCAN	PARAMETER	RAW			TREATED			SITE 1		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	1,3 DICHLOROBENZENE	8	0	0	8	0	0	1	0	0
	1,2 DICHLOROBENZENE	8	0	0	8	0	0	1	0	0
	TRIFLUOROCHLOROTOLUE	2	0	0	2	0	0	.	.	.
	ETHLYENE DIBROMIDE	8	0	0	8	0	0	1	0	0
	TOTL TRIHALOMETHANES	8	0	3	8	8	0	1	1	0
*TOTAL SCAN VOLATILES		229	0	11	229	32	16	29	4	2
*TOTAL GROUP ORGANIC		835	1	26	814	32	27	77	4	4
TOTAL		1245	290	107	1248	296	125	176	73	23

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 ^{0}C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)
3. Maximum Desirable Concentration (MDC)
4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO) (for xylenes, the AO is a total)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

INTERPRETATION OF DATA

The interpretation of analytical results that are obtained from measurements near the limit of detection of the measurement process is subject to greater uncertainty than those at higher concentrations. The principle areas of concern relate to whether the substance has actually been detected, whether it has been properly identified, and whether it is an artifact of the measurement process. In other words, false positives can be caused by the instrumentation or the test procedures used, when in fact these compounds are not present in the sample.

There are several methods to treat data from such measurements:
1. Exclude the low-level data because of this uncertainty factor. However, studies of long-term environmental trends and modelling may be adversely affected by exclusion of such data.
2. Qualify these data so the user is aware of the greater uncertainty associated with their use.

For the Drinking Water Surveillance Program, measurements near the limit of detection of the measurement process are reported qualified by the code "<T". Results quantified by "W" indicate a zero measurement. These results are reported for purposes of modelling and long-term trend analysis and no significance should be attributed to a single determination of a substance below "T" (a single determination may well be a false positive). Repeat analysis or additional data are needed before it can be stated with certainty that the substance in question was truly present. On the other hand, it is less likely that repeated detection of a substance at or near the limit of detection at a specific location is solely due to an artifact in the measurement system, and more likely represents a true positive. However the average of such data is still only an estimate of the amount of substance present subject to the possible biases of the method used.

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident

!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours
T# (T06)	Result Taken After # Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)		**DET'N LIMIT = 0**		**GUIDELINE = 0 (A1)**
MAY	0	.	.	.
JUN	5	.	.	.
JUL	3	.	.	.
AUG	35	.	.	.
SEP	7 T24	.	.	.
OCT	28 T48	.	.	.
NOV	21 T24	.	.	.
DEC	101 T48	.	.	.
STANDRD PLATE CNT MF (CT/ML)		**DET'N LIMIT = 0**		**GUIDELINE = 500/ML (A1)**
MAY	410	0	.	.
JUN	690	3	.	.
JUL	1300	6	.	.
AUG	860	11	.	.
SEP	.	0 <=>	.	.
OCT	.	3 <=>	.	.
NOV	.	71 T24	.	.
DEC	.	3 <=>	.	1 <=>
P/A BOTTLE (0=ABSENT)		**DET'N LIMIT = 0**		**GUIDELINE = 0 (A1*)**
MAY	.	0	.	.
JUN	.	0	.	.
JUL	.	0	.	.
AUG	.	0	.	.
TOTAL COLIFORM MF (CT/100ML)		**DET'N LIMIT = 0**		**GUIDELINE = 5/100ML(A1)**
MAY	66 A3C	0	.	.
JUN	72 A3C	0	.	.
JUL	230 A3C	0	.	.
AUG	200	0	.	.
SEP	66 A3C	0 T24	.	.
OCT	700 A3C	0 T48	.	.
NOV	540 T24	0 T24	.	.
DEC	2160 A3C	0 T48	.	0 T24
T COLIFORM BCKGRD MF (CT/100ML)		**DET'N LIMIT = 0**		**GUIDELINE = N/A**
MAY	1400	0	.	.
JUN	15200	0	.	.
JUL	6800	0	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
AUG	760	8	.	.
SEP	3200 A3C	4 T24	.	.
OCT	13200 A3C	2 T48	.	.
NOV	2260 T24	0 T24	.	.
DEC	9200 A3C	0 T48	.	0 T24

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)			**DET'N LIMIT = N/A**	**GUIDELINE = N/A**
MAY	.	.200	.	.
JUN	.	.200	.	.
JUL	.	.300	.	.
AUG	.	.200	.	.
SEP	.	.200	.	.
OCT	.	.200	.	.
NOV	.	.200	.	.
DEC	.	.200	.200	.200
FLD CHLORINE FREE (MG/L)			**DET'N LIMIT = N/A**	**GUIDELINE = N/A**
MAY	.	.700	.	.
JUN	.	.700	.	.
JUL	.	.400	.	.
AUG	.	.700	.	.
SEP	.	.700	.	.
OCT	.	.900	.	.
NOV	.	.900	.	.
DEC	.	.900	.100	.500
FLD CHLORINE (TOTAL) (MG/L)			**DET'N LIMIT = N/A**	**GUIDELINE = N/A**
MAY	.	.900	.	.
JUN	.	.900	.	.
JUL	.	.700	.	.
AUG	.	.900	.	.
SEP	.	.900	.	.
OCT	.	1.100	.	.
NOV	.	1.100	.	.
DEC	.	1.100	.300	.700
FLD PH (DMSNLESS)			**DET'N LIMIT = N/A**	**GUIDELINE = 6.5-8.5(A4)**
MAY	8.000	7.600	.	.
JUN	7.800	7.600	.	.
JUL	8.000	7.800	.	.
AUG	7.800	7.600	.	.
SEP	7.700	7.600	.	.
OCT	7.800	7.600	.	.
NOV	7.700	7.800	.	.
DEC	7.700	7.600	7.500	7.500
FLD TEMPERATURE (DEG.C)			**DET'N LIMIT = N/A**	**GUIDELINE = 15 (A1)**

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
MAY	9.000	9.500	.	.
JUN	6.000	8.500	.	.
JUL	8.000	11.500	.	.
AUG	13.000	14.000	.	.
SEP	10.000	10.500	.	.
OCT	12.500	14.000	.	.
NOV	6.500	7.000	.	.
DEC	6.500	6.000	18.000	10.000
FLD TURBIDITY (FTU	)		DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)
MAY	5.350	.140	.	.
JUN	1.450	.340	.	.
JUL	5.200	.650	.	.
AUG	2.800	.550	.	.
SEP	1.540	.190	.	.
OCT	6.200	.380	.	.
NOV	6.850	.320	.	.
DEC	6.500	.190	.140	.120

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (LAB)				
ALKALINITY (MG/L)			DET'N LIMIT = .200	GUIDELINE = 30-500 (A4)
MAY	104.700	97.700	.	.
JUN	103.000	95.400	.	.
JUL	97.300	90.300	.	.
AUG	102.300	94.600	.	.
SEP	101.600	98.600	.	.
OCT	99.800	93.900	.	.
NOV	102.100	96.700	.	.
DEC	105.500	99.600	100.600	100.200
CALCIUM (MG/L)			DET'N LIMIT = .100	GUIDELINE = 100 (F2)
MAY	40.800	40.000	.	.
JUN	40.000	40.000	.	.
JUL	41.400	40.600	.	.
AUG	38.800	40.800	.	.
SEP	41.800	39.800	.	.
OCT	41.700	41.200	.	.
NOV	42.000	43.600	.	.
DEC	38.600	38.800	38.000	40.200
CYANIDE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = .200 (A1)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	.002 <T	BDL	.	.
DEC	BDL	BDL	.	BDL
CHLORIDE (MG/L)			DET'N LIMIT = .200	GUIDELINE = 250 (A3)
MAY	24.300	27.400	.	.
JUN	23.600	26.600	.	.
JUL	22.900	25.300	.	.
AUG	22.400	26.000	.	.
SEP	22.000	23.100	.	.
OCT	21.900	25.000	.	.
NOV	23.200	25.700	.	.
DEC	24.900	29.800	29.100	28.700
COLOUR (TCU)			DET'N LIMIT = .5	GUIDELINE = 5.0 (A3)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
MAY	2.000 <T	.500 <T	.	.
JUN	2.500	1.000	.	.
JUL	2.000 <T	.500 <T	.	.
AUG	2.500	.500 <T	.	.
SEP	1.000 <T	BDL	.	.
OCT	2.000 <T	1.000 <T	.	.
NOV	2.000 <T	.500 <T	.	.
DEC	2.000 <T	.500 <T	.500 <T	.500 <T
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1	GUIDELINE = 400 (F2)
MAY	335	339	.	.
JUN	334	337	.	.
JUL	332	336	.	.
AUG	326	333	.	.
SEP	326	328	.	.
OCT	325	332	.	.
NOV	330	335	.	.
DEC	346	360	357	354
FLUORIDE (MG/L)			DET'N LIMIT = .01	GUIDELINE = 2.400 (A1)
MAY	.140	.870	.	.
JUN	.130	1.040	.	.
JUL	.120	1.160	.	.
AUG	.130	1.580	.	.
SEP	.140	.780	.	.
OCT	.120	.980	.	.
NOV	.120	1.020	.	.
DEC	.140	1.080	1.140	1.120
HARDNESS (MG/L)			DET'N LIMIT = .500	GUIDELINE = 80-100 (A4)
MAY	135.000	133.000	.	.
JUN	134.000	134.000	.	.
JUL	139.000	137.000	.	.
AUG	131.000	137.000	.	.
SEP	138.000	133.000	.	.
OCT	140.000	139.000	.	.
NOV	140.000	144.000	.	.
DEC	132.000	134.000	132.000	137.000
IONCAL (DIMENSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
MAY	.000 NAF	.000 NAF	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
JUN	.000 MAF	.000 MAF	.	.
JUL	3.779	4.311	.	.
AUG	4.065	1.235	.	.
SEP	1.583	.818	.	.
OCT	2.795	3.685	.	.
NOV	1.553	4.557	.	.
DEC	9.927	8.909	10.140	6.154
LANGELIER'S INDEX (DIMENSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
MAY	.546 MAF	.397 MAF	.	.
JUN	.550 MAF	.457 MAF	.	.
JUL	.461	.229	.	.
AUG	.305	.112	.	.
SEP	.484	.360	.	.
OCT	.555	.433	.	.
NOV	.388	.200	.	.
DEC	.564	.380	.405	.418
MAGNESIUM (MG/L)			DET'N LIMIT = .050	GUIDELINE = 30 (F2)
MAY	8.100	8.100	.	.
JUN	8.300	8.300	.	.
JUL	8.700	8.600	.	.
AUG	8.400	8.600	.	.
SEP	8.300	8.300	.	.
OCT	8.500	8.800	.	.
NOV	8.500	8.500	.	.
DEC	8.800	9.100	9.000	8.900
SODIUM (MG/L)			DET'N LIMIT = .200	GUIDELINE = 200 (C3)
MAY	12.800	12.400	.	.
JUN	12.000	11.800	.	.
JUL	12.200	12.200	.	.
AUG	11.600	11.800	.	.
SEP	12.000	12.000	.	.
OCT	11.400	12.100	.	.
NOV	12.000	11.800	.	.
DEC	13.200	13.800	14.000	13.800
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = .05 (F2)
MAY	.042	.016	.	.
JUN	.016	.010	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
JUL	.058	.006 <T	.	.
AUG	.016	.006 <T	.	.
SEP	.010	.002 <T	.	.
OCT	.010	.010	.	.
NOV	.014	BDL	.	.
DEC	.062	.014	.010	.012
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)
MAY	.021	.002 <T	.	.
JUN	.003 <T	BDL	.	.
JUL	.006	.001 <T	.	.
AUG	.062	.007	.	.
SEP	.003 <T	.001 <T	.	.
OCT	.010	.002 <T	.	.
NOV	.013	BDL	.	.
DEC	.069	.004 <T	.004 <T	.004 <T
TOTAL NITRATES (MG/L)		DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)
MAY	.355	.355	.	.
JUN	.360	.345	.	.
JUL	.295	.295	.	.
AUG	.330	.300	.	.
SEP	.385	.385	.	.
OCT	.290	.265	.	.
NOV	.420	.430	.	.
DEC	.550	.540	.490	.475
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = .020		GUIDELINE = N/A
MAY	.260	.160	.	.
JUN	.240	.130	.	.
JUL	.310	.190	.	.
AUG	.260	.210	.	.
SEP	.190	.160	.	.
OCT	.220	.180	.	.
NOV	.190	.170	.	.
DEC	.380	.070 <T	.180	.170
PH (DIMENSIONLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)
MAY	8.360	8.250	.	.
JUN	8.380	8.320	.	.
JUL	8.300	8.110	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
AUG	8.150	7.970	.	.
SEP	8.280	8.210	.	.
OCT	8.380	8.290	.	.
NOV	8.200	8.020	.	.
DEC	8.340	8.240	8.270	8.260
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = .0005		GUIDELINE = N/A
MAY	.002	.001 <T	.	.
JUN	.001 <T	.001	.	.
JUL	.002 <T	BDL	.	.
AUG	.002	.001 <T	.	.
SEP	BDL	BDL	.	.
OCT	.001 <T	.003	.	.
NOV	.000 <T	.002 <T	.	.
DEC	.001 <T	.001 <T	.	.
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = .002		GUIDELINE = .40 (F2)
MAY	.010	.003 <T	.	.
JUN	.010	.004 <T	.	.
JUL	.014	.005 <T	.	.
AUG	.009 <T	BDL	.	.
SEP	.003 <T	BDL	.	.
OCT	.018	.010	.	.
NOV	.011	.005 <T	.	.
DEC	.023	BDL	.	.
SULPHATE (MG/L)		DET'N LIMIT = .200		GUIDELINE = 500. (A3)
JUL	27.980	28.310	.	.
AUG	26.870	27.450	.	.
SEP	26.900	27.200	.	.
OCT	27.700	28.200	.	.
NOV	26.000	26.500	.	.
DEC	33.500	34.000	34.000	33.500
TURBIDITY (FTU)		DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)
MAY	.830	.080 <T	.	.
JUN	.610	.580	.	.
JUL	.960	.270	.	.
AUG	1.700	.410	.	.
SEP	.950	.420	.	.
OCT	1.030	.360	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
NOV	2.200	.190 <T	.	.
DEC	3.100	.150 <T	.180 <T	.250 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
METALS				
SILVER (UG/L)			DET'N LIMIT = .020	GUIDELINE = 50. (A1)
MAY	BDL	.080 <T	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	.070 <T	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)			DET'N LIMIT = .050	GUIDELINE = 100.(A4)
MAY	11.000	94.000	.	.
JUN	8.200	110.000	.	.
JUL	10.000	110.000	.	.
AUG	11.000	220.000	.	.
SEP	8.500	64.000	.	.
OCT	12.000	77.000	.	.
NOV	25.000	43.000	.	.
DEC	45.000	37.000	45.000	50.000
ARSENIC (UG/L)			DET'N LIMIT = 0.050	GUIDELINE = 50.0 (A1)
MAY	.790 <T	.390 <T	.	.
JUN	.710 <T	.580 <T	.	.
JUL	.630 <T	.280 <T	.	.
AUG	1.300	.720 <T	.	.
SEP	.600 <T	1.100	.	.
OCT	1.100	1.000 <T	.	.
NOV	.880 <T	.940 <T	.	.
DEC	1.100	.340 <T	.670 <T	.530 <T
BARIUM (UG/L)			DET'N LIMIT = 0.020	GUIDELINE = 1000. (A1)
MAY	24.000	24.000	.	.
JUN	23.000	21.000	.	.
JUL	25.000	23.000	.	.
AUG	26.000	25.000	.	.
SEP	23.000	23.000	.	.
OCT	25.000	25.000	.	.
NOV	24.000	23.000	.	.
DEC	25.000	24.000	23.000	23.000
BORON (UG/L)			DET'N LIMIT = 0.200	GUIDELINE = 5000. (A1)
MAY	33.000	31.000	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
JUN	25.000	27.000	.	.
JUL	26.000	23.000	.	.
AUG	60.000	59.000	.	.
SEP	26.000	28.000	.	.
OCT	42.000	48.000	.	.
NOV	75.000	88.000	.	.
DEC	60.000	63.000	53.000	55.000
BERYLLIUM (UG/L)		DET'N LIMIT = 0.010		GUIDELINE = .20 (H)
MAY	BDL	BDL	.	.
JUN	BDL	.070 <T	.	.
JUL	BDL	.020 <T	.	.
AUG	.070 <T	.100 <T	.	.
SEP	.040 <T	.020 <T	.	.
OCT	.070 <T	.050 <T	.	.
NOV	.160 <T	.160 <T	.	.
DEC	.080 <T	.030 <T	.070 <T	.060 <T
CADMIUM (UG/L)		DET'N LIMIT = 0.050		GUIDELINE = 5.000 (A1)
MAY	BDL	BDL	.	.
JUN	.080 <T	.070 <T	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	.090 <T	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	.070 <T	.090 <T	.090 <T	BDL
COBALT (UG/L)		DET'N LIMIT = 0.020		GUIDELINE = 1000 (H)
MAY	.060 <T	.050 <T	.	.
JUN	.060 <T	.060 <T	.	.
JUL	.040 <T	.030 <T	.	.
AUG	.090 <T	.050 <T	.	.
SEP	.130 <T	.180 <T	.	.
OCT	.180 <T	.150 <T	.	.
NOV	.120 <T	.090 <T	.	.
DEC	.190 <T	.150 <T	.170 <T	.200 <T
CHROMIUM (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 50. (A1)
MAY	2.500	1.500	.	.
JUN	.730 <T	.760 <T	.	.
JUL	.390 <T	.230 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
AUG	3.500	3.100	.	.
SEP	.770 <T	.830 <T	.	.
OCT	5.300	6.400	.	.
NOV	5.400	6.700	.	.
DEC	6.400	6.500	5.400	5.600
COPPER (UG/L)		DET'N LIMIT = .100		GUIDELINE = 1000 (A3)
MAY	2.000	1.100	.	.
JUN	2.000	2.600	.	.
JUL	2.100	2.200	.	.
AUG	1.400	2.400	.	.
SEP	.890 <T	1.300	.	.
OCT	1.200	2.300	.	.
NOV	2.800	2.400	.	.
DEC	4.600	2.500	60.000	7.900
IRON (UG/L)		DET'N LIMIT = 4.000		GUIDELINE = 300. (A3)
MAY	15.000 <T	BDL	.	.
JUN	6.900 <T	5.100 <T	.	.
JUL	12.000 <T	BDL	.	.
AUG	17.000 <T	6.500 <T	.	.
SEP	14.000 <T	BDL	.	.
OCT	11.000 <T	BDL	.	.
NOV	41.000 <T	BDL	.	.
DEC	90.000	BDL	BDL	BDL
MERCURY (UG/L)		DET'N LIMIT = 0.010		GUIDELINE = 1.000 (A1)
MAY	BDL	BDL	.	.
JUN	BDL	.030 <T	.	.
JUL	.050 <T	.030 <T	.	.
AUG	.020 <T	.020 <T	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	.020 <T	.030 <T	.	.020 <T
MANGANESE (UG/L)		DET'N LIMIT = .050		GUIDELINE = 50.0 (A3)
MAY	1.900	.450 <T	.	.
JUN	1.500	.480 <T	.	.
JUL	1.900	.350 <T	.	.
AUG	2.500	.850	.	.
SEP	1.400	.640 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
OCT	1.900	.850	.	.
NOV	2.600	.250 <T	.	.
DEC	6.900	.600	.550	.670
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.020	GUIDELINE = 500 (H)
MAY	1.200	1.300	.	.
JUN	1.100	1.300	.	.
JUL	1.100	1.300	.	.
AUG	1.200	1.200	.	.
SEP	.890	.870	.	.
OCT	1.200	1.300	.	.
NOV	1.200	1.300	.	.
DEC	1.200	1.300	1.300	1.200
NICKEL (UG/L)			DET'N LIMIT = 0.100	GUIDELINE = 50. (F3)
MAY	1.000 <T	1.700 <T	.	.
JUN	.180 <T	1.500 <T	.	.
JUL	.310 <T	.660 <T	.	.
AUG	BDL	BDL	.	.
SEP	1.500 <T	1.200 <T	.	.
OCT	1.100 <T	.940 <T	.	.
NOV	.220 <T	BDL	.	.
DEC	3.000	3.100	2.200	2.700
LEAD (UG/L)			DET'N LIMIT = 0.050	GUIDELINE = 50. (A1)
MAY	.100 <T	.080 <T	.	.
JUN	.100 <T	.480	.	.
JUL	.450	.300	.	.
AUG	.080 <T	.210	.	.
SEP	.060 <T	BDL	.	.
OCT	.080 <T	.130 <T	.	.
NOV	.130 <T	.040 <T	.	.
DEC	.650	.140 <T	1.100	.190 <T
ANTIMONY (UG/L)			DET'N LIMIT = .050	GUIDELINE = 146. (D4)
MAY	.270	.210	.	.
JUN	.270	.330	.	.
JUL	.230	.240	.	.
AUG	.750	.700	.	.
SEP	.560	.600	.	.
OCT	.590	.710	.	.
NOV	.580	.520	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
DEC	.350	.330	.460	.340
SELENIUM (UG/L)			DET'N LIMIT = 0.200	GUIDELINE = 10. (A1)
MAY	.960 <T	2.800 <T	.	.
JUN	.940 <T	.470 <T	.	.
JUL	BDL	1.100 <T	.	.
AUG	1.300 <T	1.700 <T	.	.
SEP	4.500 <T	3.400 <T	.	.
OCT	2.400 <T	6.400 <T	.	.
NOV	1.100 <T	2.800 <T	.	.
DEC	BDL	1.300 <T	1.300 <T	1.800 <T
STRONTIUM (UG/L)			DET'N LIMIT = .050	GUIDELINE = 2000.(N)
MAY	190.000	190.000	.	.
JUN	190.000	180.000	.	.
JUL	170.000	180.000	.	.
AUG	190.000	190.000	.	.
SEP	200.000	200.000	.	.
OCT	190.000	190.000	.	.
NOV	170.000	180.000	.	.
DEC	170.000	170.000	160.000	160.000
TITANIUM (UG/L)			DET'N LIMIT = .050	GUIDELINE = N/A
MAY	3.800	3.700	.	.
JUN	2.900	3.100	.	.
JUL	2.200	2.000 <T	.	.
AUG	10.000	11.000	.	.
SEP	.750 <T	.440 <T	.	.
OCT	2.800	3.400	.	.
NOV	5.100	4.000	.	.
DEC	5.200	3.100	2.900	2.900
THALLIUM (UG/L)			DET'N LIMIT = .010	GUIDELINE = 13. (D4)
MAY	BDL	BDL	.	.
JUN	.040 <T	.020 <T	.	.
JUL	BDL	BDL	.	.
AUG	.020 <T	BDL	.	.
SEP	.020 <T	.020 <T	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	BDL	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
URANIUM (UG/L)		DET'N LIMIT = .020		GUIDELINE = 20. (A2)
MAY	.310	.190 <T	.	.
JUN	.380	.210	.	.
JUL	.380	.220	.	.
AUG	.310	.190 <T	.	.
SEP	.450	.420	.	.
OCT	.340	.310	.	.
NOV	.350	.370	.	.
DEC	.360	.170 <T	.270	.240
VANADIUM (UG/L)		DET'N LIMIT = .050		GUIDELINE = 100 (H)
MAY	.250 <T	.210 <T	.	.
JUN	.270 <T	.260 <T	.	.
JUL	.270 <T	.240 <T	.	.
AUG	.300 <T	.230 <T	.	.
SEP	.320 <T	.280 <T	.	.
OCT	.250 <T	.280 <T	.	.
NOV	.260 <T	.210 <T	.	.
DEC	.390 <T	.310 <T	.280 <T	.260 <T
ZINC (UG/L)		DET'N LIMIT = .001		GUIDELINE = 5000. (A3)
MAY	1.300	1.500	.	.
JUN	1.200	2.900	.	.
JUL	1.300	1.700	.	.
AUG	1.100	1.900	.	.
SEP	1.500	1.400	.	.
OCT	1.500	1.900	.	.
NOV	1.900	2.300	.	.
DEC	4.100	3.000	9.900	2.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
PAH				
ANTHRACENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 2.8 (D4T)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	2.000 <T	BDL	.	.
AUG	BDL	BDL	.	.
	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	.
FLUORANTHENE (NG/L)			DET'N LIMIT = 20.000	GUIDELINE = 42000 (D4)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	20.000 <T	BDL	.	.
AUG	BDL	BDL	.	.
	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	.
PYRENE (NG/L)			DET'N LIMIT = 20.000	GUIDELINE = 2.8 (D4T)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	20.000 <T	BDL	.	.
AUG	BDL	BDL	.	.
	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	.
BENZO(K) FLUORANTHEN (NG/L)			DET'N LIMIT = N/A	GUIDELINE = 2.8 (D4T)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	.	BDL	.	.
AUG	BDL	BDL	.	.
	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
NOV	BDL	BDL	.	.
DEC	1.000 <T	BDL	.	.
BENZO(A) PYRENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = 10 (B1)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	10.000 <T	BDL	.	.
AUG	BDL	BDL	.	.
	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
PESTICIDES & PCB				
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 700 (G)
MAY	3.000 <T	3.000 <T	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	3.000 <T	4.000 <T	.	.
SEP	1.000 <T	BDL	.	.
OCT	1.000 <T	BDL	.	.
NOV	1.000 <T	2.000 <T	.	.
DEC	BDL	2.000 <T	.	4.000 <T
LINDANE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 4000 (A1)
MAY	BDL	2.000 <T	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	2.000 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
PHENOLICS (UG/L PHENOLICS)		DET'N LIMIT = 0.2		GUIDELINE = 2.00 (A3)
MAY	.200 <T	.400 <T	.	.
JUN	.600 <T	.400 <T	.	.
JUL	.600 <T	.200 <T	.	.
AUG	.400 <T	.200 <T	.	.
SEP	BDL	BDL	.	.
OCT	.600 <T	.800 <T	.	.
NOV	BDL	BDL	.	.
DEC	1.000	.600 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VOLATILES				
TOLUENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 24.0 (B4)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	.050 <T	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	BDL
ETHYLBENZENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 2.4 (B4)
MAY	BDL	.050 <T	.	.
JUN	BDL	.100 <T	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	.050 <T	.	.
OCT	BDL	.050 <T	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	.050 <T
O-XYLENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 300 (B4)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	.050 <T	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	BDL
STYRENE (UG/L)			DET'N LIMIT = .050	GUIDELINE = 46.5 (D2)
OCT	.150 <T	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	BDL	.	BDL
CHLOROFORM (UG/L)			DET'N LIMIT = .100	GUIDELINE = 350 (A1+)
MAY	BDL	20.600	.	.
JUN	BDL	15.800	.	.
JUL	.700 <T	18.300	.	.
AUG	BDL	22.700	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
SEP	BDL	17.000	.	.
OCT	.400 <T	30.100	.	.
NOV	.600 <T	27.300	.	.
DEC	BDL	21.000	.	19.000
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = .050		GUIDELINE = 350 (A1+)
MAY	BDL	13.450	.	.
JUN	BDL	13.000	.	.
JUL	.600 <T	12.400	.	.
AUG	BDL	15.400	.	.
SEP	BDL	12.800	.	.
OCT	.200 <T	16.150	.	.
NOV	BDL	15.850	.	.
DEC	BDL	13.900	.	13.100
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = .100		GUIDELINE = 350 (A1+)
MAY	BDL	6.400	.	.
JUN	BDL	7.800	.	.
JUL	.300 <T	5.300	.	.
AUG	BDL	10.500	.	.
SEP	BDL	8.700	.	.
OCT	.100 <T	7.300	.	.
NOV	BDL	7.900	.	.
DEC	BDL	5.600	.	5.300
T-CHLOROETHYLENE (UG/L)		DET'N LIMIT = .050		GUIDELINE = 10.0 (C2)
MAY	BDL	BDL	.	.
JUN	BDL	BDL	.	.
JUL	BDL	BDL	.	.
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	.100 <T	.	.
NOV	BDL	.100 <T	.	.
DEC	BDL	BDL	.	BDL
BROMOFORM (UG/L)		DET'N LIMIT = .200		GUIDELINE = 350 (A1+)
MAY	BDL	.600 <T	.	.
JUN	BDL	.400 <T	.	.
JUL	BDL	.600 <T	.	.
AUG	BDL	.600 <T	.	.
SEP	BDL	.800 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM AJAX WTP 1988

	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
	RAW	TREATE	SITE 1	
			STANDING	FREE FLOW
OCT	BDL	.600 <T	.	.
NOV	BDL	.800 <T	.	.
DEC	BDL	.600 <T	.	.600 <T
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = .500		GUIDELINE = 350 (A1)
MAY	BDL	41.050	.	.
JUN	BDL	37.000	.	.
JUL	1.600 <T	36.600	.	.
AUG	BDL	49.200	.	.
SEP	BDL	39.300	.	.
OCT	.700 <T	54.150	.	.
NOV	.600 <T	51.850	.	.
DEC	BDL	41.100	.	38.000

Table VI

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
STANDARD PLATE COUNT MEMBRANE FILTRATION	CT/ML	0	500/ML(A1)
P/A BOTTLE		0	0 (A1*)
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100mL(A1)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
CHLOROAROMATICS			
HEXACHLOROBUTADIENE	NG/L	1.000	450. (D4)
1,2,3-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.000	10000 (I)
1,2,4-TRICHLOROBENZENE	NG/L	5.000	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.000	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.000	10000 (D4)
HEXACHLOROBENZENE	NG/L	1.0	10. (C1)
HEXACHLOROETHANE	NG/L	1.000	1900. (D4)
OCTACHLOROSTYRENE	NG/L	1.000	N/A
PENTACHLOROBENZENE	NG/L	1.000	74000 (D4)
2,3,6-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.000	N/A
2,6,A-TRICHLOROTOLUENE	NG/L	5.000	N/A
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	50.	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	50.	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	50.	N/A
2,4,5-TRICHLOROPHENOL	NG/L	50.	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	50.	5000. (B1)
PENTACHLOROPHENOL	NG/L	50.	60000. (B1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	N/A	N/A
FIELD PH	DIMENSLESS	N/A	6.5-8.5(A4)
FIELD TEMPERATURE	°C	N/A	<15 °C(A1)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	.200	30-500(A4)
CALCIUM	MG/L	.100	100. (F2)
CYANIDE	MG/L	.001	.20(A1)
CHLORIDE	MG/L	.200	250. (A3)
COLOUR	TCU	.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.	400. (F2)
FLUORIDE	MG/L	.01	2.4 (A1)
HARDNESS	MG/L	.50	80-100(A4)
MAGNESIUM	MG/L	.05	30. (F2)
SODIUM	MG/L	.20	200. (C3)
AMMONIUM TOTAL	MG/L	.002	.05(F2)
NITRITE	MG/L	.001	1.0 (A1)
TOTAL NITRATES	MG/L	.02	10. (A1)
NITROGEN TOTAL KJELDAHL	MG/L	.02	N/A
PH	DIMENSLESS	N/A	6.5-8.5(A4)
PHOSPHORUS FIL REACT	MG/L	.0005	N/A
PHOSPHORUS TOTAL	MG/L	.002	.40(F2)
TOTAL SOLIDS	MG/L	1.	500. (A3)
TURBIDITY	FTU	.02	1.0 (A1)
METALS			
ALUMINUM	UG/L	.050	100. (A4)

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
BERYLLIUM	UG/L	.010	0.20	(N)
CADMIUM	UG/L	.050	5.0	(A1)
COBALT	UG/L	.020	1000.	(N)
CHROMIUM	UG/L	.100	50.	(A1)
COPPER	UG/L	.100	1000.	(A3)
IRON	UG/L	4.0	300.	(A3)
MERCURY	UG/L	.01	1.0	(A1)
MANGANESE	UG/L	.050	50.	(A3)
MOLYBDENUM	UG/L	.020	500.	(N)
NICKEL	UG/L	.100	50.	(F3)
LEAD	UG/L	.050	50.	(A1)
SELENIUM	UG/L	.200	10.	(A1)
SILVER	UG/L	.020	50.	(A1)
STRONTIUM	UG/L	.050	2000.	(N)
THALLIUM	UG/L	.010	13.	(D4)
TITANIUM	UG/L	.050	N/A	
URANIUM	UG/L	.020	20.	(A2)
VANADIUM	UG/L	.050	100.	(N)
ZINC	UG/L	.020	500.	(A3)
PHENOLICS				
PHENOLICS (UNFILTERED REACTIVE)	UG/L	.2	2.0	(A3)
PESTICIDES & PCB				
ALDRIN	NG/L	1.0	700.	(A1)
AMETRINE	NG/L	50.	300000.	(D3)
ATRAZINE	NG/L	50.	60000.	(B3)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700.	(G)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300.	(G)
GAMMA HEXACHLOROCYCLOHEXANE(LINDANE)	NG/L	1.0	4000.	(A1)
ALPHA CHLORDANE	NG/L	2.0	7000.	(A1)
GAMMA CHLORDANE	NG/L	2.0	7000.	(A1)
BLADEX	NG/L	100.	10000.	(B3)
DIELDRIN	NG/L	2.0	700.	(A1)
METHOXYCHLOR	NG/L	5.0	100000.	(A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000.	(D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	4.0	74000.	(D4)
ENDRIN	NG/L	4.0	200.	(A1)
ENDOSULFAN SULPHATE(THIODAN SULPHATE)	NG/L	4.0	N/A	
HEPTACHLOR EPOXIDE	NG/L	1.0	3000.	(A1)
HEPTACHLOR	NG/L	1.0	3000.	(A1)
METOLACHLOR	NG/L	500.	50000.	(B3)
MIREX	NG/L	5.0	N/A	
OXYCHLORDANE	NG/L	2.0	N/A	
O,P-DDT	NG/L	5.0	30000.	(A1)
PCB	NG/L	20.0	3000.	(A2)
O,P-DDD	NG/L	5.0	N/A	
PPDDE	NG/L	1.0	30000.	(A1)
PPDDT	NG/L	5.0	30000.	(A1)
ATRATONE	NG/L	50.	N/A	
ALACHLOR	NG/L	500.	35000.	(D2)
PROMETONE	NG/L	50.	52500.	(D3)
PROPAZINE	NG/L	50.	16000.	(D2)
PROMETRYNE	NG/L	50.	1000.	(B3)
SENCOR (METRIBUZIN)	NG/L	100.	80000.	(B2)
SIMAZINE	NG/L	50.	10000.	(B3)
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE	NG/L	10.0	N/A	
ANTHRACENE	NG/L	1.0	N/A	
FLUORANTHENE	NG/L	20.0	42000.	(D4)
PYRENE	NG/L	20.0	N/A	
BENZO(A)ANTHRACENE	NG/L	20.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
DIMETHYL BENZO(A)ANTHRACENE	NG/L	5.0	N/A	
BENZO(E)PYRENE	NG/L	50.0	N/A	
BENZO(B)FLUORANTHENE	NG/L	10.0	N/A	
PERYLENE	NG/L	10.0	N/A	
BENZO(K)FLUORANTHENE	NG/L	1.0	N/A	
BENZO(A)PYRENE	NG/L	5.0	10.	(B1)
BENZO(G,H,I)PERYLENE	NG/L	20.0	N/A	

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
DIBENZO(A,H)ANTHRACENE	NG/L	10.0	N/A	
INDENO(1,2,3-C,D)PYRENE	NG/L	20.0	N/A	
BENZO(B)CHRYSENE	NG/L	2.0	N/A	
CORONENE	NG/L	10.0	N/A	
SPECIFIC PESTICIDES				
TOXAPHENE	NG/L	N/A	5000.	(A1)
2,4,5-TRICHLOROBUTYRIC ACID (2,4,5-T)	NG/L	50.	280000.	(B1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000.	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID	NG/L	200.	18000.	(B3)
2,6-D PROPIONIC ACID	NG/L	100.	N/A	
DICAMBA	NG/L	100.	87000.	(B3)
PICHLORAM	NG/L	100.	2450000.	(D3)
SILVEX (2,4,5-TP)	NG/L	50.	10000.	(A1)
DIAZINON	NG/L	20.	14000.	(A1)
DICHLOROVOS	NG/L	20.	N/A	
DURSBAN	NG/L	20.	N/A	
ETHION	NG/L	20.	35000.	(G)
GUTHION	NG/L	N/A	N/A	
MALATHION	NG/L	20.	160000.	(G)
MEVINPHOS	NG/L	20.	N/A	
METHYL PARATHION	NG/L	50.	7000.	(B3)
METHYLTRITHION	NG/L	20.	N/A	
PARATHION	NG/L	20.	35000.	(B1)
PHORATE (THIMET)	NG/L	20.	35.	(D2)
RELDAN	NG/L	20.	N/A	
RONNEL	NG/L	20.	N/A	
AMINOCARB	NG/L	N/A	N/A	
BENOMYL	NG/L	N/A	N/A	
BUX (METALKAMATE)	NG/L	2000.	N/A	
CARBOFURAN	NG/L	2000.	18000.	(D3)
CICP (CHLORPROPHAM)	NG/L	2000.	350000.	(G)
DIALLATE	NG/L	2000.	30000.	(N)
EPTAM	NG/L	2000.	N/A	
IPC	NG/L	2000.	N/A	
PROPOXUR (BAYGON)	NG/L	2000.	90000.	(G)
SEVIN (CARBARYL)	NG/L	200.	70000.	(A1)
SUTAN (BUTYLATE)	NG/L	2000.	245000.	(D3)
VOLATILES				
BENZENE	UG/L	.050	5.0	(B1)
TOLUENE	UG/L	.050	24.0	(B4)
ETHYLBENZENE	UG/L	.050	2.4	(B4)
PARA-XYLENE	UG/L	.100	300.	(B4)
META-XYLENE	UG/L	.100	300.	(B4)
ORTHO-XYLENE	UG/L	.050	300.	(B4)
1,1-DICHLOROETHYLENE	UG/L	.100	7.0	(D1)
ETHLYENE DIBROMIDE	UG/L	.05	50.	(G)
METHYLENE CHLORIDE	UG/L	.500	1750.	(D3)
TRANS-1,2-DICHLOROETHYLENE	UG/L	.100	350.	(D3)
1,1-DICHLOROETHANE	UG/L	.100	N/A	
CHLOROFORM	UG/L	.100	350.	(A1+)
1,1,1-TRICHLOROETHANE	UG/L	.020	200.	(D1)
1,2-DICHLOROETHANE	UG/L	.050	5.0	(D1)
CARBON TETRACHLORIDE	UG/L	.200	5.0	(D1)
1,2-DICHLOROPROPANE	UG/L	.050	10.0	(G)
TRICHLOROETHYLENE	UG/L	.100	5.0	(D1)
DICHLOROBROMOMETHANE	UG/L	.050	350.	(A1+)
1,1,2-TRICHLOROETHANE	UG/L	.050	.60	(D4)
CHLORODIBROMOMETHANE	UG/L	.100	350.	(A1+)
TETRACHLOROETHYLENE	UG/L	.050	10.0	(C2)
BROMOFORM	UG/L	.200	350.	(A1+)
1,1,2,2-TETRACHLOROETHANE	UG/L	.050	0.17	(D4)
CHLOROBENZENE	UG/L	.100	1510.	(D3)
1,4-DICHLOROBENZENE	UG/L	.100	5.0	(B1)
1,3-DICHLOROBENZENE	UG/L	.100	130.	(G)
1,2-DICHLOROBENZENE	UG/L	.050	200.	(B1)
TRIFLUOROCHLOROTOLUENE	UG/L	.100	N/A	
TOTAL TRIHALOMETHANES	UG/L	.500	350.	(A1)
STYRENE	UG/L	.05	46.5	(D2)

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- and an indication of treatment efficiency of plant processes.

Program

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario; currently 44 plants are being monitored. Water supply locations have been prioritized for surveillance, based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit. It is estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analysed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling in order to acquire complete plant process and distribution system details, and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of the raw (ambient water) and the treated water at the treatment plant, and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled.

Sampling is carried out by operational personnel who have been trained in the applicable procedures.

Comprehensive standardized procedures and Field Test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". All laboratory analyses are carried out by the MOE Laboratory Services Branch.

Data Reporting Mechanism

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP co-ordinator.

DWSP INPUTS AND OUTPUTS

The DWSP INPUTS and OUTPUTS are illustrated in Fig. 1.

PROGRAM INPUTS

PLANT AND DISTRIBUTION SYSTEM DESCRIPTION

The system description includes plant specific non-analytical information acquired through a questionnaire and initial plant

visit. During the initial assessment of the plant and distribution system the questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The PLANT and DISTRIBUTION SYSTEM DESCRIPTION consists of the following seven components.

1. Process component inventory

All physical and chemical processes that the water is subjected to, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2.Treatment chemicals

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. The chemical dosages applied on the day of sampling are recorded in DWSP.

3. Process control measurements

Documentation of in-plant monitoring of process parameters (turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in

this section. In-plant monitoring results are generally not retained in DWSP but are retained by the Water Treatment Plant.

4. Design flow and retention time

The hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. The maximum, minimum and average flow as well as a record of the flow rate on the day of sampling are recorded in DWSP.

5. Distribution system description

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. Sampling system

Each plant is assessed for its adequacy in terms of sampling of bacteriological, organic and inorganic parameters. The prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant,

preferably a lab area;

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap), pump characteristics (model, type, capacity) and flow rate.

7. People

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate Ministry of Environment personnel associated with the plant.

FIELD DATA

The second major input to DWSP is field data.

Field data is collected at the plant and from the distribution system sites on the day of sampling. The field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used,

dosages, flow and retention time on the day of sampling as well as monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free,combined and total), temperature and pH. These parameters are analysed according to standardized DWSP protocols to allow for interplant comparison.

LABORATORY ANALYTICAL DATA

The third major input to DWSP is Laboratory Analytical Data.

Samples gathered from the raw, treated and distribution sampling sites are analyzed for approximately 160 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. The parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments parameters may be measured for in a "scan" producing some results for parameters that are not on the DWSP priority list but which may be of interest. The majority of the parameters are measured on a routine basis however, those that are technically more difficult and/or costly to analyse for are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems

may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change notation will e be made and intercomparison data documented.

PARAMETER REFERENCE INFORMATION

The fourth major input to DWSP is Parameter Reference Information

This is a catalogue of information for each substance analysed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database.

An example is shown in fig. 2.

A written copy (hard version) of the Parameter Reference Information will be available in the near future and is a new and sophisticated enhancement to the DWSP.

PROGRAM OUTPUTS

There are four major program outputs, Query, Action Alert, Report Generation and the Annual Report.

QUERY

All DWSP information is easily accessed through the Query function, therefore anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

ACTION ALERTS

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the publication, Ontario Drinking Water Objectives (ISBN 0-7729-2725-1 revised 1983). This publication contains health-related Maximum Acceptable Concentrations for thirty substances. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedences at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, other agency guidelines which are documented in the Parameter Reference Information may be used. If these guidelines are exceeded the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

REPORT GENERATION

Custom reports can be generated from DWSP to meet the needs of the regions and to respond to public requests.

ANNUAL REPORTS

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG. 1

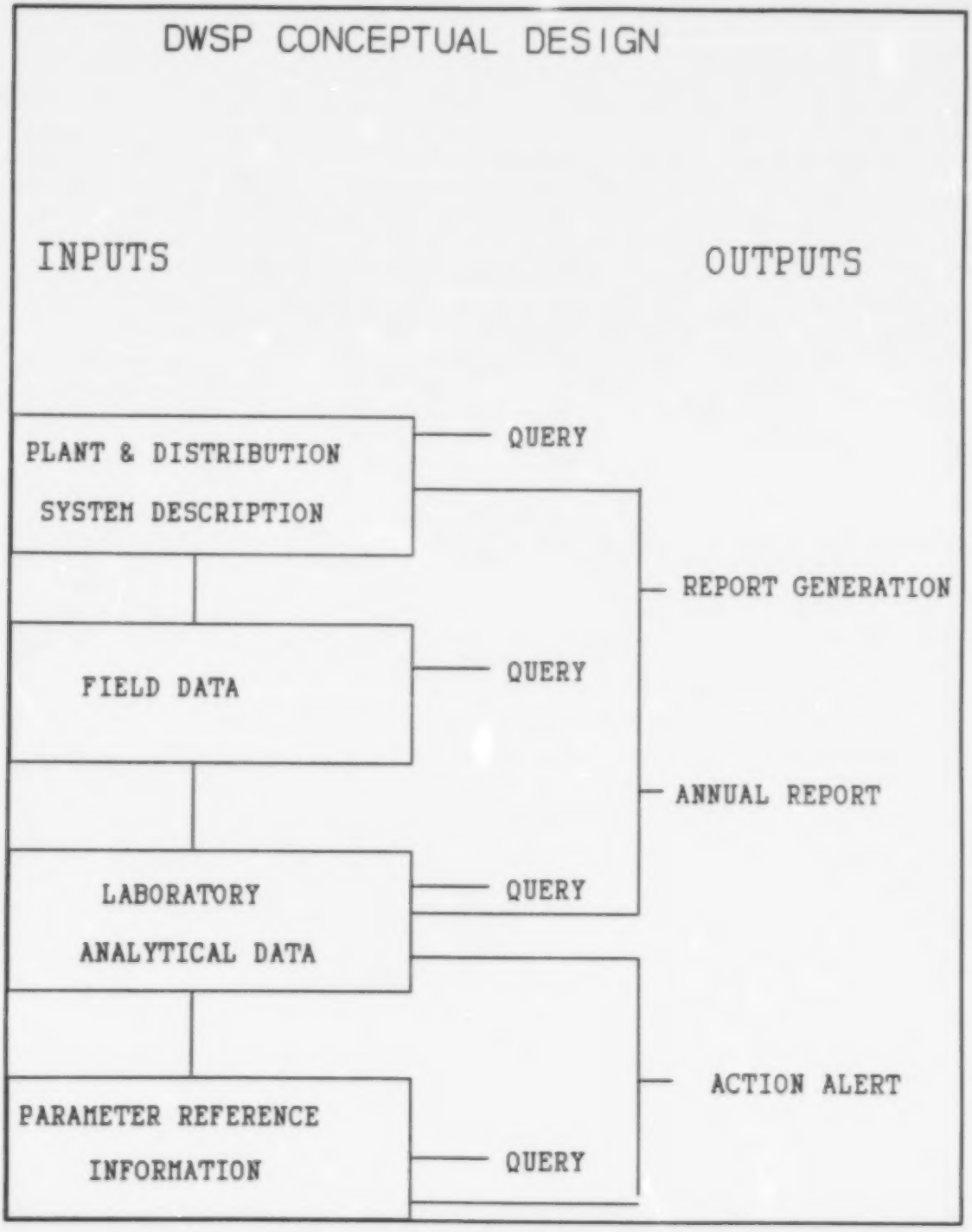
DWSP CONCEPTUAL DESIGN
INPUTS
OUTPUTS
PLANT & DISTRIBUTION SYSTEM DESCRIPTION
FIELD DATA
LABORATORY ANALYTICAL DATA
PARAMETER REFERENCE INFORMATION
QUERY
QUERY
QUERY
QUERY
REPORT GENERATION
ANNUAL REPORT
ACTION ALERT

FIG.2

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

PARAMETER REFERENCE

(B2001P)
BENZENE

SOURCE	FROM	TO	METHOD	TARG	UNIT	NOTE
EPA	C 86/04		NOMETH	.00	063000 UG/L	RMCL
EPAA	C 80/11		NOMETH	6.60	063000 UG/L	
FERC	C 84/05		NOMETH	1.00	063000 UG/L	
WHO	C 84/01		NOMETH	10.00	064000 UG/L	

DESCRIPTION: NAME: BENZENE
CAS#: 71432
MOLECULAR FORMULAE: C_6H_6
DETECTION LIMIT: (FOR METHOD POCODO) 0.05 UG/L
SYNONYMS: BENZOLE, COAL NAPHTHA, CARBON OIL (27), CYCLOHEXATRIENE (41)
CHARACTERISTICS: COLOURLESS TO LIGHT YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC, VAPOURS BURN WITH SMOKING FLAME (30)
PROPERTIES:
SOLUBILITY IN WATER: 1780-1800 MG/L AT 25 DEG C (41)
THRESHOLD ODOUR: NO DATA
THRESHOLD TASTE: 0.5 MG/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMUALTE IN LIVING ORGANISMS, APPEARS TO BIOACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT HIGH LIPID CONTENT OR ARE MAJOR METABOLIC SITES (LIVER, BRAIN), SMALL QUANITIES EVAPORATE FROM SOIL OR DEGRADE QUICKLY
SOURCES: PETROLEUM REFINING, SOLVENT RECOVERY, COAL TAR DISTILLATION, FOOD PROCESSING, TANNING.
USES: PREPERATION OF ETHYL BENZENE USED AS A STYRENE MONOMER, DETERGENTS, NYLON, AS INTERMEDIATE IN PESTICIDE PRODUCTION, SOLVENT IN RUBBER INDUSTRY, DEGREASING AND CLEANSING AGENT, GASOLINE.
TOXICITY: RATING 4 (VERY TOXIC); ACUTE - IRRITATES MUCOUS MEMBRANES, SYMPTONS INCLUDE RESTLESSNESS, CONVULSIONS, DEPRESSION, RESPIRATORY FAILURE; CHRONIC - ANEMIA AND LEUKEMIA (45).
CARINOGENICITY: HUMAN CARCINOGEN AND MUTAGEN
REMOVAL: GAC ADSORPTION, PRECIPITATION WITH ALUM FOLLOWED BY SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION (41).
MOLECULAR WEIGHT: 78.12 GRAMS
MELTING POINT: 5.5 DEGREES C (27)
BOILING POINT: 80.1 DEGREES C (27)
SPECIFIC GRAVITY: 0.879 AT 20 DEGREES C (27)
VAPOUR PRESSURE: 100 MM AT 26.1 DEGREES C
HENRY'S LAW CONSTANT: 0.00555 ATM M_3/MOLE
LOG OCT./WATER PAR.COEFF: K=1.0 1/N=1.6 R=.97 PH=5.3

Appendix B

DWSP SAMPLING GUIDELINE

i) RAW and TREATED at PLANT

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard water -fill to line
Bacti	-250 mL clear glass bottle with white seal on cap -do <u>not</u> rinse bottle; preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (**Caution:** HNO_3 is corrosive)
Volatiles (OPOPUP)	-250 mL clear glass bottle -do <u>not</u> rinse bottle -tilt bottle when filling -fill bottle completely; there should be no air bubbles.
Organic (OWOC),(OWTRI),(OAPAHX)	-1 liter brown glass bottle per scan -do <u>not</u> rinse bottle -fill to approx. 1" from top -when 'special pesticides' are requested three extra bottles per sample must be submitted
Cyanide	-500 mL clear plastic bottle -do <u>not</u> rinse bottle -fill to approx. 1" from top -add 10 drops sodium hydroxide (**Caution:** NaOH is corrosive)

Mercury	-250 mL clear glass bottle -rinse bottle and cap three times, discard then fill to top of label -add 20 drops each nitric acid and potassium dichromate (**Caution:** HNO_3 and $KCrO_7$ corrosive)
Phenols	-250 mL clear glass bottle -do <u>not</u> rinse bottle -fill to top of label as marked

<u>Steps</u>

1. Let cold water tap run for several minutes.
2. Record time in submission sheet.
3. Record teperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL clear palstic bottle -rinse bottle with sample three times and discard -fill to line
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (**Caution:** HNO_3 is corrosive)

Steps:

1. Record time on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard water -fill to line
Bacti	-250 mL clear glass bottle with white seal on cap -do <u>not</u> rinse bottle; preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (Caution: HNO_3 is corrosive)
Volatiles (OPOPUP)	-250 mL clear glass bottle -do <u>not</u> rinse bottle; preservative has been added -tilt bottle when filling -fill bottle completely; there should be no air bubbles
Organic (OWOC),(OWTRI)	-1 liter brown glass bottle per scan -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top
Cyanide	-500 mL clear plastic bottle -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top -add 10 drops sodium hydroxide (Caution: NaOH is corrosive)
Mercury	-250 mL clear glass bottle -rinse bottle and cap three times, discard then fill to top of label -add 20 drops each nitric acid and potassium dichromate (Caution: HNO_3 and KCrO7 corrosive)

Steps:

1. Record time on submission sheet.
2. Let cold water flow for ten minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), tubidity and pH on submission sheet.